

## CLAIMS

What is claimed is:

1. A pneumatic tire having one or more carcass plies extending between two inextensible beads adapted for mounting on a wheel rim that has a rim flange on each axial side of the tire, and each bead being surrounded by a bead area including a chafer that comprises the portion of the bead area that is in contact with the rim flange, the tire characterized by:

a chafer reinforcement fabric component positioned at a surface where the chafer contacts the wheel rim flange.

2. A pneumatic tire according to claim 1, further characterized in that:

when the tire is mounted on the wheel rim, the chafer reinforcement fabric component extends along the outer surface of the chafer to the radially and axially outermost point of the rim flange.

3. A pneumatic tire according to claim 1, wherein:

the tire is designed to be operated uninflated, and has a rim flange protector that extends the chafer to follow an axially outward curvature of the rim flange, the tire further characterized in that:

when the tire is mounted on the wheel rim, the chafer reinforcement fabric component extends along the outer surface of the chafer to the axially outermost point of the rim flange protector.

4. A pneumatic tire according to claim 1, wherein:

the bead area includes a toe and a bead base extending axially inward from the chafer and in contact with the wheel rim, the tire further characterized in that:

the chafer reinforcement fabric component additionally reinforces and protects the bead area by extending along the surfaces of the toe and the bead base.

5. A pneumatic tire according to claim 1, further characterized by:

the chafer reinforcement fabric component extending axially inward from the chafer radially inward of and around the bead.

6. A pneumatic tire according to claim 1, further characterized in that:

the chafer reinforcement fabric component is comprised of fibers that are woven, having weaving angles in the range of 70 degrees to 110 degrees.

7. A pneumatic tire according to claim 1, further characterized in that:

the chafer reinforcement fabric component in the tire is comprised of fibers that are oriented between approximately 30 degrees and approximately 60 degrees with respect to the

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- 5 8. A pneumatic tire according to claim 1, further characterized in that:  
the chafer reinforcement fabric component comprises non-metallic fibers.
9. A pneumatic tire according to claim 1, further characterized in that:  
the chafer reinforcement fabric component comprises monofilament fibers.
10. A pneumatic tire according to claim 1, further characterized in that:  
the chafer reinforcement fabric component is impregnated with an elastomer adapted for chafing and tear resistance.
- 10 11. A chafer reinforcement for a pneumatic tire having one or more carcass plies  
extending between two inextensible beads adapted for mounting on a wheel rim that has a rim  
flange on each axial side of the tire, and each bead being surrounded by a bead area including a  
chafer that comprises the portion of the bead area that is in contact with the rim flange, the  
chafer reinforcement characterized by:  
a chafer reinforcement fabric component positioned at a surface where the chafer  
15 contacts the wheel rim flange.
12. A chafer reinforcement according to claim 11, further characterized in that:  
the chafer reinforcement fabric component extends along the entire outer surface of the  
chafer.
13. A chafer reinforcement according to claim 11, further characterized in that:  
20 the chafer reinforcement fabric component additionally reinforces and protects the bead  
area by extending along the surfaces of the bead area wherever surfaces of the tire can contact  
the wheel rim and rim flange during mounting of the tire and during operation of the tire.
14. A chafer reinforcement according to claim 11, further characterized by:  
the chafer reinforcement fabric component extending axially inward from the chafer  
25 radially inward of and around the bead.
15. A chafer reinforcement according to claim 11, further characterized in that:  
the chafer reinforcement fabric component is comprised of non-metallic cords; and  
in the tire, the cords are oriented at a non-zero angle with respect to the radial direction.
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- 30 16. A chafer reinforcement according to claim 11, further characterized in that:  
the chafer reinforcement fabric component is comprised of fibers that are woven, having  
weaving angles in the range of 70 degrees to 110 degrees; and  
the fibers of the chafer reinforcement fabric component in the tire are oriented between  
approximately 30 degrees and approximately 60 degrees with respect to the radial direction.

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17. A chafer reinforcement according to claim 11, further characterized in that:  
the chafer reinforcement fabric component comprises monofilament organic fibers.
18. A chafer reinforcement according to claim 11, further characterized in that:  
the chafer reinforcement fabric component is impregnated with an elastomer adapted for  
5 chafing and tear resistance.
19. A method of constructing a pneumatic tire having one or more carcass plies  
extending between two inextensible beads adapted for mounting on a wheel rim that has a rim  
flange on each axial side of the tire, and each bead being surrounded by a bead area including a  
chafer that comprises the portion of the bead area that is in contact with the rim flange, the  
10 method comprising the steps of:  
constructing a chafer reinforcement fabric component from fibers;  
positioning the chafer reinforcement fabric component at the surface of the chafer where  
the chafer contacts the wheel rim flange; and  
orienting the fibers at an angle of approximately 30 degrees to approximately 60 degrees  
15 to the radial direction.
20. A method according to claim 19, further comprising the steps of:  
anchoring the chafer reinforcement fabric component by extending the chafer  
reinforcement fabric component from the chafer around the bead; and  
further reinforcing and protecting the bead area by extending the chafer reinforcement  
20 fabric component along the surfaces of the bead area wherever surfaces of the tire can contact  
the wheel rim and rim flange during mounting of the tire and during operation of the tire.

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